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## ABSTRACT

A method and device for detection and quantification of biologically significant analytes in a liquid sample is described. The method includes contacting a volume of a liquid sample with predetermined amounts of at least a first and second redox reversible species having redox potentials differing by at least 50 millivolts. At least one of the redox reversible species comprises a liquid sample diffusible conjugate of a ligand analog of an analyte in the liquid sample and a redox reversible label. A predetermined amount of at least one specific binding partner for each analyte to be measured is combined with the sample and current flow is measured at first and second anodic and cathodic potentials and correlated with current flows for known concentrations of the respective diffusible redox reversible species. Diagnostic devices and kits, including such devices and the specified specific binding partner(s) and redox reversible species are also described.